

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A mixer device having an input terminal and an output terminal, comprising:

an amplifier circuit including:

a first amplifier whose input-to-output characteristic indicates a hyperbolic tangent function characteristic;

a second amplifier whose input-to-output characteristics indicates an exponential characteristic, the second amplifier being connected in parallel to the first amplifier; and

an input node and an output terminals node which are common to the first amplifier and the second amplifier; and

a bias controller ~~configured~~ to control a bias of at least one of the first amplifier and the second amplifiers amplifier; and

a variable gain an additional differential amplifier connected between the output terminal and [[a]] the output node [[of]] common to the first amplifier and the second amplifier and the output terminal; and

a gain controller to supply a gain control signal to the variable gain amplifier.

Claim 2 (Currently Amended): A mixer device having an input terminal and an output terminal, comprising:

an amplifier circuit including:

a differential amplifier whose input-to-output characteristic indicates a hyperbolic tangent function characteristic and which is configured by a differential pair of transistors connected to a variable current source;

a common emitter amplifier whose input-to-output characteristic indicates an exponential characteristic and which is connected in parallel to the differential amplifier and is configured by a pair of common-emitter configuration transistors;

an input node and an output terminals node which are common to the differential amplifier and the common emitter amplifier, an input signal being input to the input ~~terminals~~ node and an output signal output from the output ~~terminals~~ node;

and

a bias control configured to control a bias of at least one of the differential amplifier and the common emitter amplifier; ~~and~~

a variable gain ~~an additional differential~~ amplifier connected between the output terminal and ~~[[a]] the output node [[of]] common to the differential amplifier and the common emitter amplifier and the output terminal; and~~

a gain controller to supply a gain control signal to the variable gain amplifier.

Claim 3 (Currently Amended): A mixer device having an input terminal and an output terminal, comprising:

an amplifier circuit including:

a differential amplifier whose input-to-output characteristic indicates a hyperbolic tangent function characteristic and which is configured by a differential pair of transistors whose emitters are connected to a variable current source;

a common emitter amplifier whose input-to-output characteristic indicates an exponential characteristic and which is connected in parallel to the differential amplifier and is configured by a pair of common-emitter configuration transistors whose emitters are grounded through a variable voltage source;

an input node and an output terminals node which are common to the differential amplifier and the common emitter amplifier, an input signal being input to the input ~~terminal~~ node and an output signal from the output ~~terminals~~ node; and

a bias controller configured to control a bias of at least one of the differential amplifier and the common emitter amplifier; ~~and~~

a variable gain ~~an additional differential~~ amplifier connected between the output terminal and ~~[[a]]~~ the output node of the differential amplifier and the common emitter amplifier ~~and the output terminal, and~~

a gain controller to supply a gain control signal to the variable gain amplifier.